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EXAMINER	
JONES, HUGH M	

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2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,919	PATEL ET AL.	
	Examiner	Art Unit	
	Hugh Jones	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/23/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-42 of U. S. Application 10/617,919, filed 7/9/2003, are pending.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 1-37, 41 are rejected under 35 U.S.C. 101 because the claimed invention is drawn to non-statutory subject matter since the claims are drawn to an abstract mathematical algorithm or disembodied program steps and are not tangible.

- claims 1-29: Analysis of the claims indicates that the "system", is merely abstractions and/or models. The claims are not concrete and tangible.
- claims 30-37: the method appears to require a computer, which has not been claimed. Thus, the steps appear to be disembodied program steps and are not statutory. The claims are not concrete and tangible.
- claim 41: a data packet (disembodied ones and zeros) does not comprise a statutory class. The claim is not concrete, useful and tangible.

The Examiner submits that the claims as written, are merely drawn to nonstatutory descriptive material since the claimed abstract mathematical algorithm or program steps does not impart any functionality (let alone be stored on a tangible medium)). (i.e. not a computer program product or executable instructions embodied on

a computer-readable medium). Analysis of the claim indicates that the claims are drawn to an abstract algorithm or disembodied computer program steps and are not tangible. Furthermore, the claims are not useful and concrete. The claims are merely drawn to rearranging and forming subsets of numbers.

4. *MPEP 2106 recites the following supporting rational for this reasoning:*

"Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when **employed as a computer component**. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data. **Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se**. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is **recorded on some computer-readable medium** it becomes structurally and **functionally interrelated to the medium** and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized."

5. *In this case, applicants have merely claimed an abstract algorithm or disembodied program steps that are not embodied on a computer-readable medium and specifically employed as a computer component to be executed on a processor and perform the claimed limitations. Thus, Applicants have attempted to claim nonfunctional descriptive material.*

6. An invention which is eligible for patenting under 35 U.S.C. 101 is in the useful arts when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. *The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a* ***"useful, concrete and tangible result."*** The test for practical application as applied by the

examiner involves the determination of the following factors:

(1) Useful - The Supreme Court in *Diamond v. Diehr* requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished. Applying utility case law the examiner will note that:

(a) the utility need not be expressly recited in the claims, rather it may be inferred.

(b) if the utility is not asserted in the written description, then it must be well established.

7. Furthermore, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(2) Tangible - Applying *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefore, is nonstatutory under 35 U.S.C. 101. In *Warmerdam* the abstract idea of a data structure became capable of producing a useful result when it was fixed in a tangible medium which enabled its functionality to be realized.

(3) Concrete - Another consideration is whether the invention produces a concrete result. Usually, this question arises when a result cannot be assured. An appropriate rejection under 35 U.S.C. 101 should be accompanied by a lack of

enablement rejection, because the invention cannot operate as intended without undue experimentation.

8. A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. Schrader, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in i) below), or (B) be limited to a practical application within the technological arts (discussed in ii) below). See Diamond v. Diehr, 450 U.S. at 183-84, 209 USPQ at 6 (quoting Cochrane v. Deener, 94 U.S. 780, 787-88 (1877)) ("A [statutory] process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.... The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence."). See also Alappat, 33 F.3d at 1543, 31 USPQ2d at 1556-57 (quoting Diamond v. Diehr, 450 U.S. at 192, 209 USPQ at 10). See also id. at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing O 'Reilly v. Morse, 56 U.S. (15 How.) at 114-19). If a physical transformation occurs outside the computer, a disclosure that permits a skilled artisan to practice the claimed invention, i.e., to put it to a practical use, is sufficient. On the other hand, it is necessary for the claimed invention taken as a whole to produce a practical

application if there is only a transformation of signals or data inside a computer or if a process merely manipulates concepts or converts one set of numbers into another.

9. The claims merely recite an abstract mathematical algorithm or disembodied program steps. The claims are not concrete, useful and tangible.

10. Claims 38-40 are statutory because of the structure as indicated by the means for language.

11. Claim 42 is statutory because the film stack comprises a material is tangible.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. Claims 1-42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

- the claims refer to a model and simulation. However, it is noted that few specifics of any model and simulation and its implementation are actually disclosed in the specification. The specification appears to be directed at explaining *how* the program is to be used. The program has not been disclosed.

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. Claims 10-15, 17-19, 24, 35-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The preamble of claim 1 recites "verifying and/or validating". This is ambiguous. The language indicates three possible claims, and is not standard US claim construction.
- claim 24 recites a model "contemplating". It is not possible for a model to think.
- Claims 10-15, 17-19, 35-37 recite a distribution. This is ambiguous because the claims do not recite what the distribution is related to.

Claim Interpretation

16. The following observations are made.

- Many claims recite *can*, *can be, utilizing, for* and *facilitating*. Any recitations following such language are provided no patentable weight.
- The specification (at the end) recites, "Furthermore, to the extent that the term "includes" is used in either the detailed description or the claims, such term is intended to be inclusive in a manner similar to the term "comprising" as "comprising" is interpreted when employed as a transitional word in a claim." This is not agreed to. The words are provided their standard meaning. If Applicants are of the opinion that the word *includes* means something other

than the normal meaning, then such language should have been used, possibly using *comprising* instead.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedberg in view of (Panoramic v3.01 (paper by Pistor and five pages from the Panoramic Technology homepage dates 9/28/2002).

20. Specifically, Friedberg (denoted as "F") discloses the limitations as subsequently disclosed including textual display of film stack information (section 4.4, pp. 72-74).

21. However, Friedberg does not provide many details and does not appear to provide a visual display of the film stack in the user interface.

22. Panoramic Technology 3.01 (denoted as "P") provides such a teaching (fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

23. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the Friedberg teaching with the Panoramic teaching for the following reasons. Friedberg teaches that PROLITH is used to carry out the simulation (abstract). Panoramic discloses that the simulator is equivalent to or better than PROLITH (see first page and last page). Panoramic discloses (first page) that their product is less expensive). Panoramic further discloses (first page) that the user will be able to see all the details in order to facilitate the simulating and will have more control over the simulation thus leading to more flexibility.

24. Specifically, Friedberg and Panoramic disclose:

1. A system that facilitates verifying and/or validating an APC assisted process via simulation (F: sections 3-4), comprising: a film stack representation (F: section 4.4, pp. 72-74; pp. 72-73; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout); and a canonical model that predicts process rates (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout), the process rates predicted based at least in part upon an exposed material in the film stack representation (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

2. The system of claim 1, the film stack representation comprising at least one layer (F: section 4.4, pp. 72-74; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

3. The system of claim 2, the layer comprising at least one block, the at

least one block defined by material type and size (F: section 4.4, pp. 72-74; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

4. The system of claim 3, the film stack representation generated via associating blocks within a graphical user interface (F: section 4.4, pp. 72-74; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

5. The system of claim 3, the film stack representation generated via associating blocks utilizing a defined grammar (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

6. The system of claim 3, the material type and size being user-defined (F: section 4.4, pp. 72-74; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

7. The system of claim 1, the film stack representation comprising at least one guarded process rate; the at least one process rate being associated with one or more blocks (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

8. The system of claim 7, a precondition utilized as a guard for a predictive model based process rate (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

9. The system of claim 1, the canonical model receiving a chamber state and predicting a process rate based at least in part upon parameters of the chamber state, the parameters including at least one of elapsed simulation time, process tool settings, exposed material, and semiconductor device characteristics (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

10. The system of claim 9, one of the process tool settings being generated

according to a distribution (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

11. The system of claim 10, the distribution being user-defined (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

12. The system of claim 10, the distribution obtained via a design of experiments (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

13. The system of claim 9, device characteristic inputs being generated according to a distribution (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

14. The system of claim 13, the distribution being user-defined (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

15. The system of claim 13, the distribution obtained via a design of experiments (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

16. The system of claim 1, further comprising a solver for generating recipe parameter recommendations according to at least one of inputs, outputs, goal(F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-4, 11, pages 1-4 of Pistor) and constraint(F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-4, pages 1-4 of Pistor) of the canonical model (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

17. The system of claim 16, a parameter recommended by the solver varied

according to a distribution (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

18. The system of claim 17, the distribution being user-defined (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

19. The system of claim 17, the distribution obtained via a design of experiments (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

20. The system of claim 17, the parameter generated by a pseudorandom variate generator (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

21. The system of claim 1, further comprising a rendering component that facilitates display of the film stack representation as a process is simulated (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

22. The system of claim 21, the rendering component facilitating display of at least one of inputs to the canonical model, outputs of the canonical model, parameters of a process chamber, simulation start time, elapsed simulation time, the film stack representation, and distribution of the inputs (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

23. The system of claim 1, the canonical model comprising one or more of model variables, model constraints, and model goals (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

24. The system of claim 23, the canonical model contemplating one of the

model constraints and the model goals (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

25. The system of claim 24, the canonical model predicting process rates in two dimensions (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

26. The system of claim 24, the canonical model predicting process rates in three dimensions (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

27. The system of claim 1, wherein a simulation speed can be customized by a user (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

28. The system of claim 1, wherein a simulation can be halted by one of a user and a predefined interrupt (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

29. The system of claim 1 comprised by a computer-readable storage medium (F: section 4; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

30. A method for validating a semiconductor manufacturing process (F: sections 3-4), comprising: generating a film stack representation (F: section 4.4, pp. 72-73; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout); and providing a canonical model that predicts process rates for an exposed material in the film stack representation given a process step (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

31. The method of claim 30, further comprising: creating a chamber state, the

chamber state comprising parameters associated with a process chamber; and relaying the chamber state to the canonical model (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

32. The method of claim 31, further comprising displaying the film stack representation as a process is simulated (F: section 4.4, pp. 72-73; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

33. The method of claim 31, further comprising displaying chamber state parameters and associated outputs from the canonical model (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

34. The method of claim 31, further comprising determining appropriate chamber parameters given current chamber parameters and a predicted process rate (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

35. The method of claim 34, the determined chamber parameters varied according to a distribution (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

36. The method of claim 35, the distribution being user-defined (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

37. The method of claim 35, the distribution obtained via a design of experiments (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

38. A system that facilitates verification of an APC assisted process (F: sections 3-4) comprising: means for generating a film stack representation

(F: section 4.4, pp. 72-73; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout); means for obtaining parameters relating to a process chamber at a particular point in time (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout); and means for predicting a process rate based at least in part upon the film stack representation and the parameters (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

39. The system of claim 38, further comprising means for selecting a simulation time (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

40. The system of claim 39, further comprising means for displaying a simulation of the predicted process as applied to the film stack representation (F: ; P: fig. 2-5, 11 of Pistor and pages 1, 3-4 of the website printout).

41. A data packet that passes between at least two computer processes (F: sections 3-4), comprising: a canonical model that predicts process rates based at least in part upon parameters of a tool chamber, an exposed material, and a particular process step (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout); and a film stack representation that comprises a layer, the layer including a material utilized by the canonical model to predict a process rate (F: 4.4, pp. 72-73; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

42. A system that facilitates in situ monitoring of a semiconductor manufacturing process (F: sections 3-4), comprising: a process rate calculator that can calculate semiconductor manufacturing process rates based

at least in part upon sensed parameters of a process chamber tool and time between receiving sensed parameters (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout) (F: 4.4, pp. 72-73; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout); a film stack comprising a material (F: 4.4, pp. 72-73; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout); a solver component that generates desirable parameters of the process chamber tool based at least in part upon the calculated process rate and the sensed parameters (F: section 4, fig. 4.1, 4.3, 4.7, Appendix B; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout); and a rendering component that displays the film stack as the film stack is processed (F: 4.4, pp. 72-73; P: fig. 2-5, 11 and pages 1-4 of Pistor and pages 1, 3-4 of the website printout).

25. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to: Dr. Hugh Jones telephone number (F: ; 571) 272-3781,

Monday-Thursday 0830 to 0700 ET,

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

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(703) 308-9051 (for formal communications intended for entry)

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